IN THE CLAIMS

Amend the claims as indicated below by the markings.

1-17. (Cancelled)

18. (Currently Amended) A method of sensing temperature through intensity modulation of a light signal using an intensity modulating and remote sensing optic fiber temperature switching immersion probe, said method comprising the steps of:

(a) immersing the probe in a container of liquid, said liquid having a temperature below a melting point of a chemical;

(b) recording a value of an optical signal generated by transmission of the light signal through the chemical in a solid state and at room temperature, said optical signal being received from the chemical by a bundle of optical fibers;

(c) detecting a maximum optical signal by using a back coated concave mirror to reflect a light that is generated by transmission of the light signal through the chemical at its melting point and in a liquid phase, said maximum optical signal consisting of said reflected light received by the bundle of optical fibers;

(d) using a photo-detector to detect the optical signal from the probe via the bundle of optical fibers;

(e) signal processing an output of the photo-detector by a signal processing circuit; and

(f) enabling actuation of a relay dependent on the signal from the probe to at least one of stop a heating process and raise an alarm.

19. (Original) The method according to claim 18, wherein the liquid is selected from the group consisting of water, acetone, carbon tetrachloride and transformer oil.

20. (Previously Presented) The method according to claim 18, wherein the chemical is selected from the group consisting of: oxalic acid, sodium chloride, paraffin wax and acetamide.

21. (Previously Presented) The method according to claim 18, wherein the chemical has a melting point in a range of 75-85 °C.

22. (Previously Presented) The method according to claim 18, wherein optical signal propagation in the probe is secure and without any cross talk or interference problems.

23. (Previously Presented) The method according to claim 18, wherein the optical signal in the probe is unaffected by presence of electrical signals.

24. (Previously Presented) The method according to claim 18, further comprising the step of:

using the probe for remote sensing up to a distance of 1 km.

25. (Previously Presented) The method according to claim 18, wherein the probe at an increased temperature provides an increase of six times in an output signal over a signal at room temperature.

26. (Previously Presented) The method according to claim 18, wherein the chemical is opaque at room temperature and becomes transparent at a predetermined higher temperature enabling actuation of a relay to at least one of stop a heating process and raise an alarm.

27. (Previously Presented) The method according to claim 18, wherein the optical signal from the probe is comprised of a focused light reflected by the mirror.

28. (Currently Amended) The method according to claim 18, wherein the ~~mirror is comprised of a~~ concave mirror has ~~having~~ a predetermined focal length, and said detecting step detects the optical signal at a predetermined multiple of the focal length.

29. (Previously Presented) The method according to claim 28, further comprising the step of:

transmitting the light signal through a cell having a focal length twice the focal length of the concave mirror.

30. (New) A method of sensing temperature through intensity modulation of a light signal using an intensity modulating and remote sensing optic fiber temperature switching immersion probe, said method comprising the steps of:

providing a chemical into a sensing cell;

evacuating the sensing cell to provide an evacuated sensing cell containing the chemical at a sensing end of the probe;

immersing the sensing end of the probe in a container of liquid, said liquid having a temperature below a melting point of the chemical;

transmitting a transmitted optical signal through a first bundle of optical fibers into the chemical in the sensing cell while the chemical is in a solid state;

receiving a received optical signal by a second bundle of optical fibers as a result of the transmitted optical signal being transmitted into the chemical while in the solid state, said second bundle of optical fibers being adjacent said first bundle of optical fibers;

detecting the received optical signal using a photo-detector connected to said second bundle of optical fibers;

recording a first value of the received optical signal while the chemical is in the solid state;

transmitting the transmitted optical signal through the first bundle of optical fibers into the chemical in the sensing cell while the chemical is in a liquid state;

reflecting the transmitted optical signal that passes through the chemical in the liquid state with a concave outside surface mirror disposed at an end of the sensing cell opposite the first and second bundles of optical fibers;

receiving the reflected optical signal after the optical signal passes through the chemical in the liquid state, the reflected optical signal being received by the second bundle of optical fibers;

detecting the reflected optical signal using the photo-detector connected to the second bundle of optical fibers;

processing an output of the photo-detector to distinguish a reflected optical signal resulting from the chemical in the liquid state from the received optical signal resulting from the chemical in the solid state; and

controlling a process depending on the distinguished output of the photo-detector.

31. (New) A method as claimed in claim 30, wherein said reflecting step includes reflecting the transmitted optical signal by a distance of approximately twice a focal length of the concave mirror.